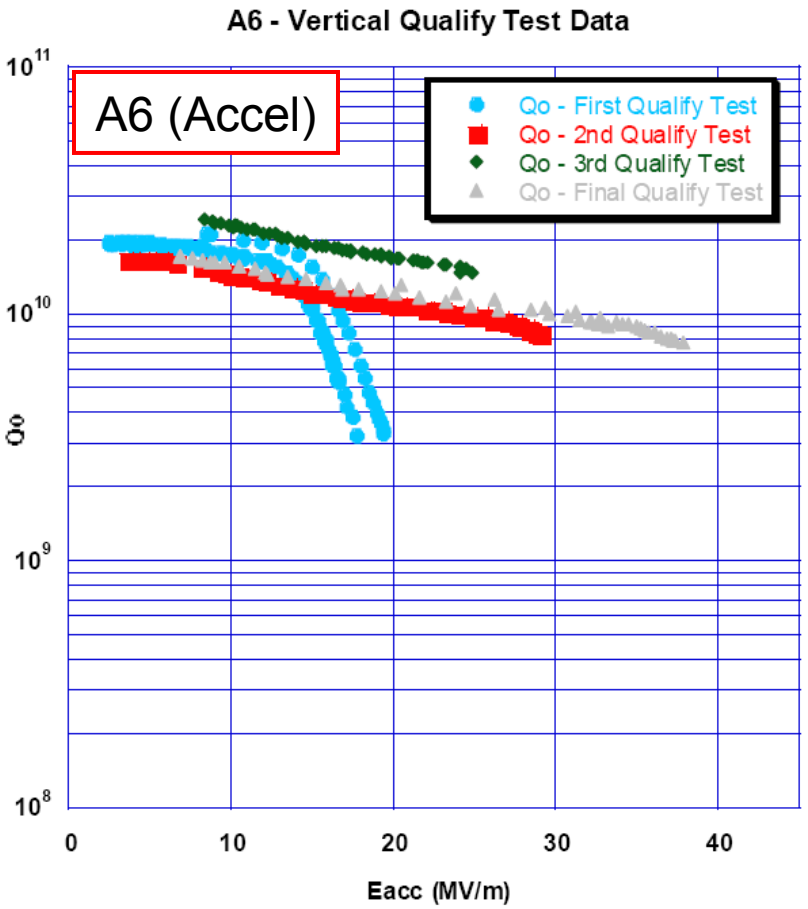
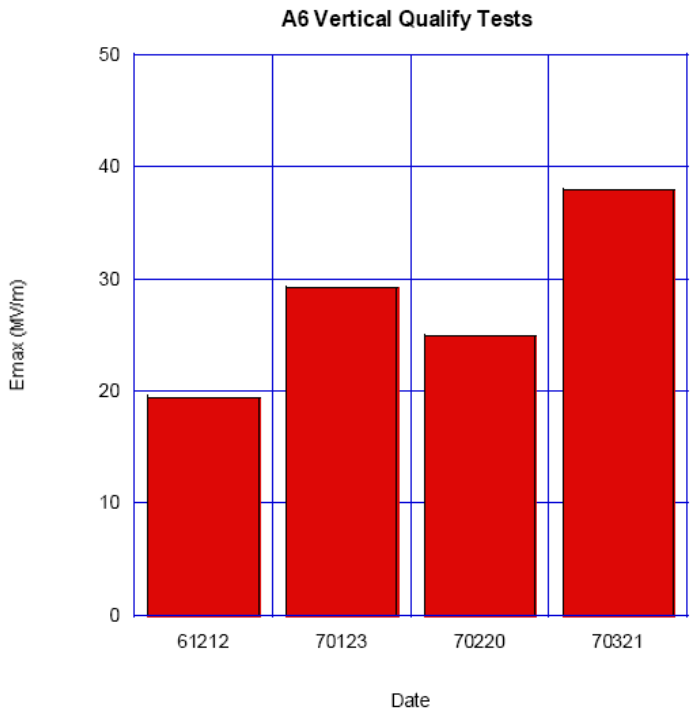
Overview of US work on ACCEL6

JLab ACCEL6 Results (1)

J. Mammosser, TTC Meeting at Fermilab, April 2007





JLab ACCEL6 Results (2)

J. Mammosser, TTC Meeting at Fermilab, April 2007

Material Removal Data: Equators

A6	FPC								Fp
	1	2	3	4	5	6	7	8	9
As received	2.974	2.95	3.002	3.042	2.921	2.946	2.973	3.07	3.015
After 1st	2.792	2.789	2.818	2.852	2.73	2.748	2.78	2.871	2.824
	182	**161**	**184**	**190**	**191**	**198**	**193**	**199**	**191**
After 2nd	2.773	2.76	2.792	2.83	2.706	2.711	2.758	2.849	2.795
	201	**190**	**210**	**212**	**215**	**235**	**215**	**221**	**220**

All cavity processing done @JLab

Processing Recipe
J. Mammosser, TTC Meeting at Fermilab, April 2007

- Processing recipe
  - –Degrease
  - –Electropolishing (20 μm)
  - –Degrease
  - –First HPR+dry
  - –First cleanroom assembly
  - –Second HPR+dry
  - –Final cleanroom assembly
  - –Evacuation and leak check
  - –Low temperature (110 C) bake

Note: all cavities get 150 um bulk EP

Material Removal (microns)
R. Geng, AES Meeting at JLab, Aug 2007

	1st test	2nd test	3rd test	4th test
A7	172	198	224	251
A6	187	213	239	265
AES1	213	236	252	269
AES2	164	190		
AES3	177	200		
AES4	221	257	277	

Note: updates to AES2,3,4 since August 2007 are not shown

Accel-6 couplers – May 2008

- Fermilab (T. Khabiboulline, priv. comm., May 8, 2008)
  - Qext (input coupler) trimmed to ~1E10
  - Qext (field probe) trimmed to ~1E12
  - Estimation based on measurement using out-of-tune cavity, corrected for the poor field flatness
  - sensitivity is 5 dB/mm. For example, to increase Qext 10 times you need to shorten probe antenna length by 2 mm.
- JLab (R. Geng, priv. comm., May 8, 2008)
  - Both input coupler antenna and field probe antenna were trimmed by 2 mm
  - Measured Qext (input coupler) 5.5E9
  - Measured Qext (field probe) 6.3E11

JLab Accel-6 Field Flatness

- Cavity field flatness measured to be 98%

JLab Accel-6 Work:

A6 assembly observations

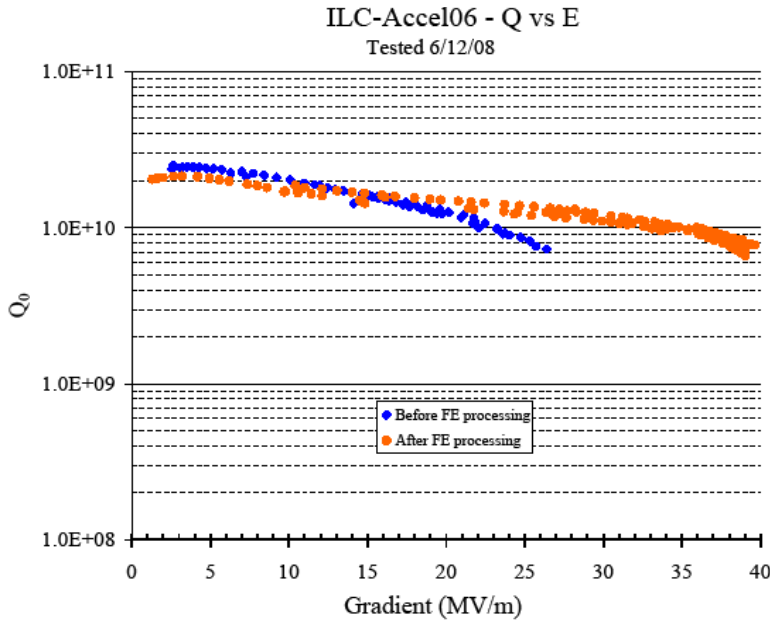
Using FNAL supplied hardware

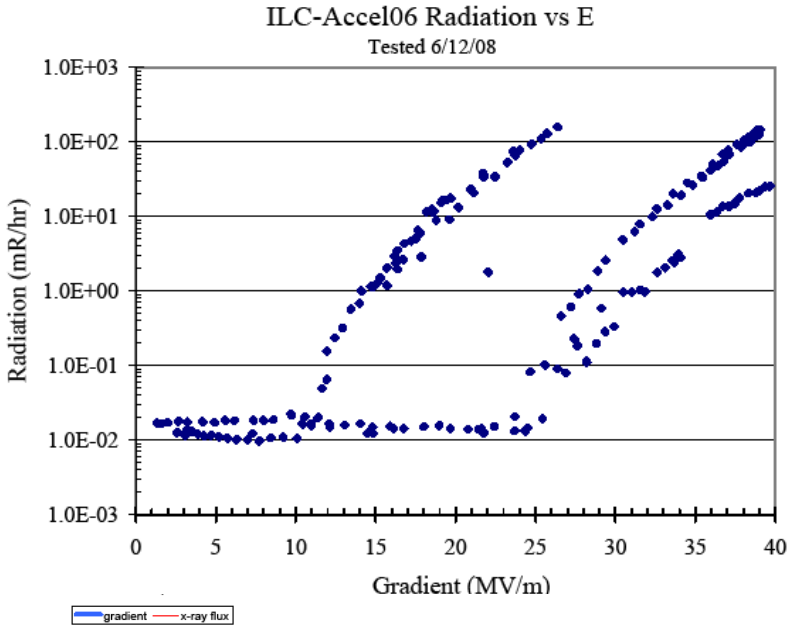
D. Bice, priv.comm., May 21, 2008

- Nitrogen cleaning of EPed hardware quicker per part
  - Increased number of hardware items increased overall nitrogen cleaning time
- NW8 supplied studs too short
  - Flange 7.7 mm, blank 9.3 mm, gap w/ seal 2.5 mm, stud 20.5 mm
  - Used JLAB standard hardware
  - Limited space on back side of flange may make nut attachment to stud difficult
- NW40 studs too short
  - Flange 12.5 mm, FPC 10 mm, gap w/ seal 2.5 mm, stud 30 mm
  - Used JLAB standard hardware
- Studs supplied for attaching burst disc too short (limited thread engagement)
  - Used MDC nut plates w/ silver plated screws
  - Could not use bronze nut plates because diameter of burst disc shaft was too large
  - Could not insert screw from burst disc side because distance between disc and flange did not accommodate screw length
- Shaft from NW 78 to conflate too small (diameter vs length)
  - Very weak (flex / twist) when tightening conflate screws
- Valve must be positioned properly (exactly as in Joe Ozelis cartoon) to avoid interference with studs / flanges / valve
- Studs used for attaching valve to flange should be long enough to bottom out in flange threads
  - Usable as supplied

FNAL 2K RF Test June 12

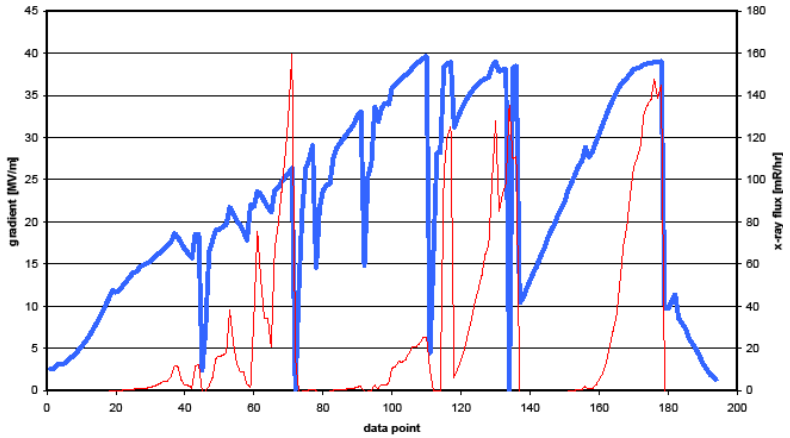
J. Ozelis, priv. comm., June 12, 2008





Qext (field probe) = 7.8×10^{11}
Qext (input coupler) ~ 7×10^{9}

Time progression of gradient and x-ray flux



ACCEL6 Status/Plan

Week of	**Work plan**
May 5	Send cavity hardware to JLab
May 12	JLab work: field flatness measurement and tune if <95%, Q_{ext} measurement on A6 of field probe and input coupler (time permitting), HPR Assembly Pump and leak check in cleanroom
May 19	Receive cavity from JLab in MP9 – Expected May 23
May 26 & June 2	Cavity vacuum leak check in MP9 and cavity assembly at IB1
June 9	1st Cold test in IB1 (June 12)
June 16	2nd Cold test in IB1 (~June 18 and/or June 19)